

## **ABSTRACT**

*PT XYZ is a state-owned company that specializes its business activities in producing vaccines and sera. raw materials stored in the inventory warehouse have their own specifications and treatments. There are some items that are very sensitive to temperature. PT XYZ inventory warehouse has 2 types of cold room storage, namely cold rooms with temperature specifications of (2)-(8)°C and temperature specifications  $\leq(-20)$ °C. There is a problem where the cold room capacity with a temperature of  $\leq(-20)$ °C has experienced overcapacity or storage has reached more than 100% of the total capacity. One of the items stored in the cold room with a temperature of  $\leq -20$ °C is the Vaccine Vial Monitor (VVM). The VVM is a highly sensitive item that can easily be damaged if not stored in the correct conditions. It is also a crucial component in vaccine production. This issue leads to disruptions in warehouse processes, one of which is the extended time required for item retrieval. The prolonged retrieval time causes the picking process for VVM to exceed the company's standard time.*

*Considering the issues that have arisen, Therefore improvements are needed that can reduce picking time. The first proposal is to increase the capacity of the PT XYZ cold room by adding level s to the shelves. After the shelf capacity increases, no products are stored in the aisle. Next is to allocate goods storage by dividing goods into FSN categories based on the speed of movement of goods. Furthermore, goods are allocated using a dedicated storage policy where the same goods must be stored in a fixed place so that goods with the same batch are not stored separately. The next step is to design a simulation model to see if the proposal given can reduce the retrieval time of goods. there are three scenarios in this experiment.*

*In scenario one, a storage allocation proposal was made using dedicated storage and no additional operators. The result is a 31% reduction in time with an average time of 12.7 minutes. The second proposed scenario with fixed storage is random storage and the number of operators is increased to two, then a 46% decrease in time is obtained with an average time of 9.91 minutes. And the last proposed scenario is dedicated storage and the addition of two operators, resulting in a*

*decrease of 57% with an average time of 7.97 minutes. The scenario chosen is scenario three because it can reduce the time to pick up larger items. With the addition of level s, the cold room capacity increases by 75% and can save operational costs for renting reefer containers by 53%.*

***Keywords - Discrete event simulation, Dedicated storage, Overcapacity, Cold room, Raw material Warehouse***